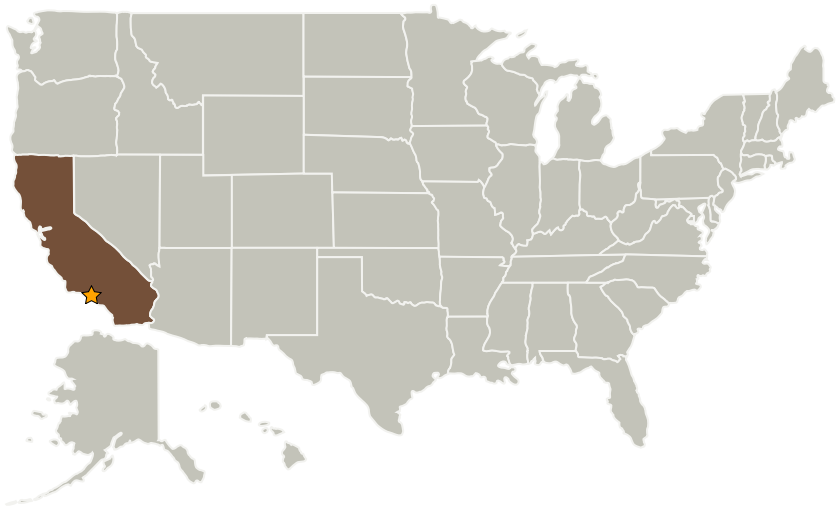
# A 32x32 Direct Hybrid Germanium Photoconductor Array with CTIA Readout Multiplexer, Phase I

Completed Technology Project (2006 - 2006)

## Project Introduction

We propose to investigate the feasibility of developing a two-dimensional far infrared photoconductor array with the following key design features: 1- A top-illuminated, 2D germanium array (32x32 single or 64x64 mosaic) with the possibility of extension to very large formats. The quantum efficiency is enhanced by metalizing the bottom surface for a second pass. 2- A 2-side buttable 32x32 (64x64 mosaic) CTIA readout multiplexer using advanced cryo-CMOS process. The unit-cell design is optimized for far IR detectors, eliminates detector debiasing, and improves pixel uniformity. The readout is operational down to at least 2.0K. 3- A novel, direct hybrid design using indium-bump technology. This integrated design offers superior noise performance and effectively addresses the readout glow, detector heating, and thermal mismatch between the detector and the readout. This is the key discriminator of this project. The projected sensitivity of this array as well as >1 kpixel (64x64 mosaic) format meets the stated requirements of future NASA instruments. This effort fits well within the scope of the SBIR Subtopic S4.01 and will be a benefit to many large and small NASA projects such as SOFIA and SAFIR.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Jet Propulsion Laboratory (JPL)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Jet Propulsion Laboratory(JPL) | Lead Organization | NASA Center | Pasadena, California |
| TechnoScience Corporation | Supporting Organization | Industry | Palo Alto, California |

| Primary U.S. Work Locations |
|---|
| California |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes